may be noted that the depression bounding that side of the column supporting the part of the head above is filled up, but on the other hand that a ridge runs down the hind edge of the inner side of the shaft from near the brim of the cavity for the inner condyle. On the whole the bone gives the impression of a better knit, and more muscular animal, of a size too superior, to be included in the same species with *S. ursinus*—one whose last molar must have equalled, or nearly equalled in size, the great sectorial of a large dog and must have been fully competent to the work whereof so many traces have been left.

On Brachalletes Palmeri an Extinct Marsupial.

By Charles W. De Vis, B.A.

A conspicuous feature in the skeletons of kangaroos is the inordinate elevation of the great trochanter of the femur. In the level of its apex above that of the 'head' of the bone there is an excess pervading the family, neither individual, specific, nor generic variation being carried to any great extent. The fact will appear more precisely evident if we measure the gluteal angle in several of the genera — and by gluteal angle is meant the angle made with the long axis of the bone by a straight line touching the top of the trochanter and the summit of the head. In *Macropus major* we find it to be 52° in *M. rufus*, 54° in *Halmaturus dorsalis*, 56° in the femur figured in the Foss. Mamm. of Aust. as that of *Palorchestes Azael*, it is 46° and in six other fossil species examined for the purpose it ranges from 60° to 45°. The value of this angle is the measure of the leaping ability of the animal, the propellers of the weighty trunk acting on the limb to be extended with a force proportionate, inversely to the inclination, and directly to the resultant length of the line of leverage. Whence we may conclude that any considerable depression of the trochanter is an index to concomitant modifications of the general economy sufficient to bring about at least very distinct generic differentiation. In this predicament stands a femur lately found

at Chinchilla associated with a number of bones which from their characters and condition may well have belonged to the same animal, and which have on the whole a strong macropodal facies.

Its gluteal angle is 77½°, three times the average of the measurements previously given. That so open an angle and consequent loss of saltatory power should be recognised in any member of the more typical genera of the Macropodidæ or Protemnodontidæ is hardly possible. The present femur, though equal in size to that of Palorchestes Azael, the largest of the Macropods described by Professor Owen, cannot therefore have belonged to a co-species, since the cranial characters of *Palorchestes* shew its approach to the normal kangaroos rather than to the Protemnodonts whose skull presents some incipient affinity with that of the Nototheres. It is rather in alliance with the Protemnodonts themselves that we must seek the extinct owner of the thigh-bone before us, and in *Procoptodon Goliath* we find an animal not much inferior in size. To this genus, however, we may reasonably hesitate to refer it. Of the once largely evolved Protemnodonts we have a surviving genus in *Halmaturus*, and though the trochanter in *Halmaturus*, at least in *H. dorsalis*, is not so much elevated as in *Macropus*, the gluteal angle is still 30°, and it can hardly be supposed that *Procoptodon*, one of its relatives, diverged from it so widely in the activity of its hind limb. It is, indeed, within the limits of possibility, that a creature with teeth so aberrant as those of *Procoptodon* may eventually declare itself but remotely allied to *Protemnodon*, *Sthenurus*, &c., and that the femur under examination may actually belong to it, but pending discovery, it appears to the writer prudent to give these bones a distinctive name. In the future a synonym of *Procoptodon* will probably cause less inconvenience than a mistaken identification with it of bones not belonging to it. The word *Brachalletes* is coined for the purpose of expressing a conception of the contracted gait of the animal—the specific name appended refers to the part taken by Sir A. Palmer in the discovery of its bones.

The greatest breadth of this thigh-bone between the lower and inner edge of the head and the middle of the outer edge of the trochanter is $5\frac{1}{8}$ inches—its breadth at the distal end of the trochanterian pit is 3 inches, and its height from the same point to the top of the trochanter major is $3\frac{1}{8}$ inches. The corresponding numbers in *P. Azael* are $4\frac{3}{4}$, $3\frac{3}{8}$, and $4\frac{1}{2}$, in *M. Titan* $3\frac{1}{4}$, $2\frac{1}{8}$, and $2\frac{7}{8}$, and in *M. major* $2\frac{3}{4}$, $1\frac{3}{4}$, and $2\frac{1}{4}$. The breadth of the femur of *Brachalletes* being to that of the bone of a kangaroo six feet long from tip to tip as 41, 22, the length of the extinct animal represented by it may have been about 11 feet 6 inches.

The broad and low trochanter-major presents but a very dubious indication of a suture defining an anchylosed tuberosity; the antero-internal constriction is no less obscure. The upper surface of the neck is long and gently sloping; the head strongly convex, much more so than in *P. Azael*, and together with the neck is set on less obliquely with the transverse diameter of the shaft than in *M. major*. The lesser trochanter departs considerably from its position and form in typical macropods; it is much further removed downward from the level of the head, and in this respect resembles that of *P. Azael;* it consists of a strong round tubercle, from which suddenly slopes away a low ridge, or rather ridge-like expansion of the intero-posterior edge of the shaft; the depression between this ridge and the intero-anterior edge is long and deep; the broad surface between it and the trochanterian fossa is gently convex; the fossa itself is long and deeply excavated; the neck is relatively longer than in the true kangaroos, and the fossa more external, the space between it and the edge of the trochanter being but a fourth of the whole breadth of the bone, whereas in *M. Major* it is four-sevenths. The posterior ridge continued downward from the great trochanter for five inches does not terminate abruptly and sharply, but subsides gradually into the rough depression beneath. In *M. Major* a transverse line touching the bottom of the fossa cuts the lower third of the muscular scar above mentioned; in the fossil this rough tract is lower than that imaginary line by a space equal to half its own length. The shaft is antero-posteriorly compressed, and has a regularly oval-section;

it is broken off at the commencement of the rough surface above the "third" trochanter, where its diameter is 2 inches, that of *M. Major* being 1. In the head of the tibia we are struck with as great a deviation from macropodal form as in the femur; there is no anterior tuberosity prolonged in the plane of the articular surface. That surface is equilateral, measuring $2\frac{7}{8}$ inches on each of its three sides. A broad and high intercondylar ridge slopes gently to the rounded anterior apex of the triangular surface, whence the profile of the bone descends almost vertically for $\frac{3}{8}$ inch to the origin of the broad procnemial ridge; yet the transverse groove below the edge of the hinder-articular surface is as deeply cut as in existing kangaroos. In this characteristic feature, as well as in the depth and breadth of the excavation of the outer facet of the shaft, and in the sharp, longitudinal ridges separating the other facets, the tibia is entirely macropodal; but in the fore and aft contraction of its roundly triangular articulating surface it suggests a tentative departure towards the slow-paced giants of the class.

Of the rest of the remains, two distal ends of left femurs are alone sufficiently well preserved to merit notice. These possess the usual characters of the kangaroo femur. So far as can be estimated, they are of exactly the same size transversely as that of *P. Azael*, but have apparently a far greater length of the condylar surfaces. Besides this they present several minor differences which forbid their identification with the fossil figured by Professor Owen. Into these distinctive features it seems unnecessary to enter. Enough of detail has already been given to render the present communication tedious.

On the Habits of the Mallee Hen, Leipoa Ocellata.

By K. H. Bennett.

This singular bird as its trivial name implies, is an inhabitant of the arid dreary Mallee Scrubs that clothe a large area of the western portion of New South Wales, and even larger extents of some of the adjoining colonies, but as my experiences of the bird and its habitat are confined to the former colony, I can speak